

IN THE SPECIFICATION

Please amend the specification as follows:

At page 1 of the original application, the second and third partial paragraphs on page 1 corresponding to paragraphs [0002] and [0003] of the published application, please amend the paragraphs as follows:

[0002] to a method for impact compression of a condensed (liquid or, preferably, solid) substance to a superdense state in which pycnonuclear processes ~~and inertial confinement fusion (ICF hereafter)~~ may proceed, and

[0003] to a structure of devices based on relativistic vacuum diodes (RVD hereafter) including plasma cathodes, designed for carrying out ~~the~~ said method.

At page 1 of the original application, the fourth full paragraph on page 1 corresponding to paragraph [0007] of the published application, please delete the paragraph as follows:

[0007] ~~In future, this method may be useful for obtaining energy by the ICF with utilization of preferably solid targets.~~

At page 1 of the original application, the twelfth partial paragraph on page 1 corresponding to paragraph [0012] of the published application, please amend the paragraph as follows:

[0012] "pycnonuclear process" is such a recombinational interaction (~~'cold' in particular~~) between components of electron-nuclear and electron-nucleonic plasma of the target substance compressed to a superdense state causing at least the target isotopic composition change;

At page 2 of the original application, the sixth full paragraph on page 2 corresponding to paragraph [0021] of the published application, please delete the paragraph as follows:

[0021] ~~Worth to be mentioned that said limitations of the target mass are important mainly for the ICF because 1 mg of deuterium or a mixture of deuterium and tritium has an energy equivalent of about 20-30 kg of trinitrotoluene.~~

At page 3 of the original application, the first through fifth full paragraphs on page 3 corresponding to paragraphs [0027] to [0031] of the published application, please delete the paragraphs as follows:

[0027] ~~For years, efforts to realize said theoretical assumptions in practice had been directed only to the ICF the industrial mastering of which seemed to be sufficient for the humanity to move to "energy paradise".~~

[0028] ~~For this reason, only gaseous deuterium or deuterium and tritium were used as an active substance from the very beginning, and targets were produced in the shape of tight empty spheres filled with microscopic (about 0,1 mg) portions of said hydrogen isotopes. Then, the beams of laser drivers were pointed at each such target uniformly and synchronously from many sides.~~

[0029] Heating of the shell caused an ablation (partial evaporation) of its outer portion. The expansion of the evaporated material was giving rise to reactive forces which caused implosion, i.e. uniform compression of the inner portion of the shell and active substance of the target in the direction to the sphere center (see, e.g., (1) U.S. Pat. No. 4,401,618; (2) J. Lindl, Phys. of Plasmas, 1995; (3) K. Mima et al., Fusion Energy, 1996. IAEA, Vienna, V. 3, p. 13, 1996).

[0030] This ICF scheme seemed to be irreproachable. Actually, the duration of laser radiation pulses can be brought to about 1 ns. This could ensure efficient time compression of an energy flux, and a sharp decrease in the target surface area could be a prerequisite for the space compression of said flux as well.

[0031] Unfortunately, the efficiency of lasers does not exceed 5%, that from very beginning made doubtful the effectiveness of the laser driver, taking into account Lawson criterion (J. D. Lawson, Proc. Phys. Soc., B.70, 1957). Further, the synchronization of lasers switching requires a sophisticated automatic control system. And, finally, the ablation is accompanied with significant losses in energy for heating the shell and target as a whole. Thus, nobody has brought so far the gaseous substance of the target to the superdense state and has got a positive yield of energy that could exceed the energy consumption for ICF initiation.

At page 5 of the original application, the second full paragraphs on page 5 corresponding to paragraph [0046] of the published application, please amend the paragraph as follows:

[0046] An effort in creation of a method for compressing a substance by impact in the RVD ~~for ICF~~ is known from U.S. Pat. No. 3,892,970. This method includes:

At page 6 of the original application, the fourth and fifth full paragraphs on page 6 corresponding to paragraphs [0056] and [0057] of the published application, please amend the paragraph as follows:

[0056] However, such as much as possible uniform compression of the target, which is necessary for ~~the ICF and~~ pycnonuclear processes, is unachievable by shaping the electron beam only. Therefore, the described RVD and its analogues can not be feasibly applied in the processes of impact compression of a substance up to a superdense state.

[0057] Problems in suppressing the pinch in the gap between the electrodes and in providing the ~~self-focussing~~ self-focusing of electron beams on the target surface made many physicists so pessimistic that they came to a conclusion of principal inapplicability of RVD's as drivers for transmutation processes ~~and ICF~~ (see, e.g., (1) James J. Duderstadt, Gregory Moses, Inertial Confinement Fusion. John Wiley and Sons, New York, 1982. (2) E. P. Velikhov, S. V. Putvinsky. Fusion Power. Its Status and Role in the Long-Term Prospects. In 4.2.2. Drivers for Inertial Controlled Fusion <http://recom.website.ru/wfs-moscow.etc>).

At page 11 of the original application, the second full paragraph on page 11 corresponding to paragraph [0103] of the published application, please amend the paragraph as follows:

[0103] The first additional feature consists in that the current-conducting rod of the plasma cathode is pointed and the dielectric end element is provided with an opening for setting on said rod the setting part of which is located together with the pointed end inside the said opening. Such design makes it possible to stabilize the plasma cathode operation and at least partially to adjust the gap between the electrodes in the RVD by shifting the dielectric end element with respect to the current-conducting rod.

At page 12 of the original application, the fifth full paragraph on page 12 corresponding to paragraph [0111] of the published application, please amend the paragraph as follows:

[0111] The first additional feature consists in that the current-conducting rod of the plasma cathode is pointed and the dielectric end element is provided with an opening for setting on said rod the setting part of which is located together with the pointed end inside the said opening. As mentioned above, this makes it possible to use the plasma cathode at least as one of means for adjusting the gap between the RVD electrodes.

At page 16 of the original application, the fourth full paragraph on page 16 corresponding to paragraph [0157] of the published application, please amend the paragraph as follows:

[0157] Electron beam power $2 [[.]] \leq 10^9$ to $0.75 [[-]] \leq 10^{12}$ W

At page 23 of the original application, the sixth full paragraph on page 23 corresponding to paragraph [0234] of the published application, please delete the paragraph as follows:

[0234] ~~Third, ICF using chemical elements widely spread in nature and their compositions as fuel.~~